

ANNUAL STATUS REPORT FISCAL YEAR 1994-95 LONG-TERM PLANNING SUPPORT AND NORTH DELTA MANAGEMENT ACTIVITIES

INTERIM NORTH DELTA PROGRAM OVERVIEW

It has long been recognized that water transfer through the central Delta is limited by the capacities of existing channels and the Delta Cross Channel. Increased channel capacities could result in more reliable water supplies for the SWP, improved Delta water quality, flood control, and a reduction in the deleterious effects of reverse flow in the west Delta. The Department Publication, **Alternatives for Delta Water Transfer, November 1983** documented a wide range of alternatives for improving through-Delta facilities, including various options for the north Delta area.

By 1987 the Department had formulated three separate Delta planning programs for the south, west, and north Delta regions. Scoping meetings for the North Delta Management Program were held on July 31, 1987 and August 25, 1987. Subsequently the Department proposed a three-phase action program for the north Delta. The phased program proposal was set forth in **North Delta, Water Management Program, March 1988**. It proposed channel improvements for the South Mokelumne River in the first phase, partial tide gate structures along the Sacramento River system in the second phase, and additional connecting channels to the Sacramento River in later phases.

The scoping process was completed in 1989 with the selection of the Corps as the lead federal agency (under its regulatory authority), release of a Notice of Preparation of an EIR and a Notice of Intent to prepare an EIS. Additional comments were solicited. The results of the scoping meetings and comments received in response to the notices were documented in **North Delta Water**

Management, Scoping Report for Environmental Impact Report and Environmental Impact Statement, November 1989.

The conceptual design for the tide gate structures was investigated by Dr. J. J. DeVries under contract with the Department, summarized in **Report on Feasible River Control Structures for Delta Facilities, January 1990.**

The program engineering and environmental analyses were documented in **Draft Environmental Impact Report, Environmental Impact Statement, North Delta Program, November 1990.** Public meetings were held to receive comments on February 21 and February 28, 1991. The public comment period was extended to June 30, 1991. Comment letters were compiled in **Written Comments on the North Delta Program Draft EIR/EIS, December 1991.**

The Corps commented extensively, and as lead federal agency required that extensive, detailed resource investigations be undertaken in order to meet its criteria for a regulatory EIS. As a result of these and other comments, various resource investigations for the EIR/EIS were initiated or expanded. These covered a wide range of topics, including wildlife habitat, biological assessment, flood modeling, SWP and Delta hydrodynamic modeling, jurisdictional wetlands delineation, fishery impacts, dredged materials and soils toxic contaminants, cultural resources, recreation, topography, seepage, sedimentation and scour, and alternative design development.

As these various studies were initiated and pursued, staff worked closely with the Corps and other regulatory and cooperating agencies to assure that the studies, when complete, would indeed meet their needs. This was a challenging undertaking, due to the variety, complexity and magnitude of the requested studies, rapidly changing planning constraints and regulatory requirements, and difficulty gaining access to regulatory agency staffs to resolve issues. Section staff responded to these challenges by implementing the following measures:

- Maintain detailed accounts of all meetings and regulatory input to help study managers keep track of study progress and to assure that regulatory agencies remained consistent and accountable for their

decisions.

- Research and understand the relevant laws and regulations applicable to each area of study.
- Explicitly negotiate the thresholds of significance, area of coverage, methods of analysis, and level of detail for each subject category. Ideally this should be completed prior to initiating environmental studies, but due to the number of studies required, this must be done simultaneously for the various subject areas, rather than sequentially.
- Augment Department staff with one or more comprehensive consultant contracts to assure that appropriate staff resources and expertise are available in all specialties when needed to complete the environmental documentation process.

In addition to advancing the resource and technical studies required to respond to comments on the draft EIR/EIS, the program activities have expanded to respond to critical unfolding issues related to reducing fishery impacts, coordination with other agency actions, and protection of long-term planning options through land acquisition and management. In particular, the resource evaluations and activities have been crafted to assure maximum utility and compatibility with the State-Federal long-term Bay-Delta solution finding process.

Activities in all these areas are summarized in the following paragraphs, along with background information to provide the proper context for current activities.

EIR/EIS ACTIVITIES, INTERIM NORTH DELTA PROGRAM

WILDLIFE HABITAT EVALUATION STUDIES

Background

USFWS staff prepared the **Draft Fish and Wildlife Coordination Act Report, North Delta Management Project, October 1990**. However, there was strong disagreement by DFG over the methods and results documented in this report. Extensive coordination with USFWS, USACE and DFG has resulted in a DWR/USFWS contract for a revised habitat impacts analysis for the north Delta project area, with DWR, DFG, and USFWS as HEP Team participants. The contract included both terrestrial and aquatic analysis. Progress with the USFWS was disappointing. The USFWS staff completed acetate overlays of habitat types and advanced HEP model selection. However, as of June 20, 1994, USFWS staff has not actively conducted technical studies for over six months, with no immediate prospects for improvement. We therefore did not renew their contract, and instead turned to DFG, which had expressed great interest in doing the work.

FY 94-95 Activities

Since the fall of 1994 regular HEP team meetings have been conducted. The acetate overlays were divided into two groups, and digitized by DFG and UC Berkeley staffs. This work is now 95% complete. Model selection and verification is about 95% complete. The highest priority is to apply the models to the Grizzly Slough borrow/mitigation site and to prepare a baseline HEP report for the property. The second step is to conduct the alternative analysis, using the digitized data in a GIS system. (Contact: Jim Martin 3-9715, Ray McDowell, 3-9499)

BIOLOGICAL ASSESSMENT

Background

Ecos Inc. prepared a **Sensitive Species Survey Report for the North Delta Water Management Project** in July 1990. The work was deemed to be incomplete by the Corps because the surveys focused on the anticipated areas of physical disturbance but did not include areas of potential hydrologic impacts. Extensive coordination with USFWS, NMFS, USBR, Corps, and DFG led to a contract with USBR to do the Biological Assessment for both the INDP and ISDP through a subcontractor, Miriam Green Associates. Avian field surveys for the INDP began in early FY 93-94.

FY 94-95 Activities

Plant and reptile studies were completed as dictated by the seasonal needs of each particular special status species. A draft Biological Assessment has been submitted to us. We have commented, and a final report, including impact analyses, is nearly complete. Despite extensive coordination with USFWS, DFG, Corps, and NMFS, there is not full agreement on the scope and methods of study, which could become an issue as the EIR/EIS studies draw to a close. (Contact: Jim Martin, 3-9715)

FLOOD ANALYSES

Background

A cooperative Corps/DWR technical study beginning in 1989 has resulted in the development of a Dynamic Wave, Unsteady State model of the north Delta channels, overflow areas, and hydraulic structures. The model has been recognized as the best available tool for evaluating flood management options for the area. It has been further refined by Ensign and Buckley, consulting engineers for County of Sacramento National Flood Insurance Program studies and local flood control analyses. Analysis of the flood protection benefits of the North Delta Program in its ability to reduce the 100-year flood elevations in the north Delta area was completed and incorporated into the 1990 DEIR.

All survey data used to develop the approximately 120 cross sections for the model were meticulously reviewed for accuracy and completeness and compiled in a memorandum report, **Network Cross Sections, Base Condition, March 1994.**

The DWOPER model has been used to evaluate the effects of the NDP on the floodplains of the lower magnitude floods. The impact of the lower water surface elevations on the 2-year floodplain was evaluated and delineated on USGS 7.5' quads to assist in delineating the jurisdictional wetlands within the area of potential hydraulic impact. Modeling for the base condition and two of the NDP alternatives was completed and documented in a report, **Hydrology Report (1), Two-year Floodplain, North Delta Area, February, 1994.**

FY 94-95 Activities

The models, data, and analytical methods used in the INDP flood modeling effort were documented in a report, **Hydrology Report (2), Low Frequency Floods in North Delta Region, March 1995.**

A system for documenting, revising, and processing geometric data for the model was developed. This system allows us to visually compare existing and alternative cross sections, and modify the data by point and click or keyboard entry.

Flood modeling is being updated to incorporate new geometric data, improvements in hydrologic inputs, and improvements in levee breach simulation developed by Ensign and Buckley.

Despite acceptance of DWR's flood modeling to date, we recognize that the hydrologic complexity and lack of verification data from actual events make it imperative that we take advantage of flood events as they occur to gather additional data, including flow, stage, precipitation, and area of inundation. Following the high water during the winter of 1995 the Mokelumne River reach from I-5 to New Hope Landing was surveyed to locate the high water profile. (Contact: Sina Darabzand, 3-9648, Shahram Ahi, 3-7195)

STATE WATER PROJECT AND DELTA MODELING

Background

Modeling was completed for the 1990 DEIR/EIS. However, due to the rapidly changing operating rules, other projects, model changes, new project alternatives, and updated hydrologic data, the runs must be redone for the new DEIR/EIS.

FY 94-95 Activities

New Delta transfer equations were developed using DWRDSM, for the base condition and for key INDP alternatives. These were used as input to generate new carriage water relationships, which in turn provided the basis for updated DWRSIM runs. The DWRSIM runs were documented in two memorandum reports, **DWR Simulation Studies, 1995 Level, Interim North Delta Program, May 1995** and **DWR Simulation Studies, 2020 Level, Interim North Delta Program, June 1995**.

Considerable effort was devoted to evaluating the carriage water phenomenon because the potential water supply benefits of the INDP accrue from savings in carriage water. The Department's current thinking is that carriage water requirements exist, but are considerably less than previously thought. DWRDSM studies conducted as part of this effort have verified the existence of carriage water, as well as significant water quality benefits associated with improved cross Delta water transfer.

DWRDSM runs for the various INDP alternatives were initiated in May 1995. (Contact: Sina Darabzand, 3-9648, Shahram Ahi, 3-7195)

EVALUATION OF INDP IMPACTS ON FISHERIES

Background

A fisheries analysis was completed for the Draft EIR/EIS, with the assistance of DFG and ESO staffs. We have held off on updating the fishery impacts analyses because this is one of the most changeable resource categories, highly dependent upon new data, project operational changes, and modeling results.

FY 94-95 Activities

Efforts have focused on a preliminary analysis of the potential benefits and impacts of a screened diversion at Hood. INDP staff developed a spreadsheet model to take a first cut at the analysis. A more detailed analysis was performed by ESO, incorporating survival rates computed by the USFWS salmon survival model and flow distributions computed by DWRDSM for representative months. (Contact: Marco Bell, 3-9981, Michelle Wong, 3-6059)

A key concern raised by resource agencies is the potential impact of channel modification on shallow water habitat. ESO staff has begun analyzing this concern, and is currently developing an analytical approach, in close coordination with DFG and USFWS staffs. (Contact: Jim Martin, 3-9715, Ray McDowell,)

JURISDICTIONAL WETLANDS DELINEATION

Background

In FY 92-93 Section staff and Jones and Stokes completed mapping jurisdictional wetlands within the expanded north Delta study area, which was documented in a report, **Final Wetland Delineation of the 100-Year Floodplain in the Northern Portion of the Sacramento-San Joaquin Delta, California, June 21, 1993.**

After a six-month review period, the Corps concluded that the study area needed to be enlarged to include the interiors of islands and tracts within the study area which were protected by levees, which would effectively double the study area to nearly 120,000 acres. We prepared detailed documentation tracing the project chronology and explained the legal and technical basis for the original study area and study methods employed. In further discussions with the Corps, we agreed to conduct additional aerial photography-based delineations only in the limited areas along the watersides of levees lining Beaver Slough, Hog Slough, and Sycamore Slough to fully satisfy Corps requirements.

FY 94-95 Activities

The additional delineation required by the Corps was completed by ESO staff, then digitized by Central District Staff. This delineation was documented in a February 6, 1995 memorandum report, **Wetland Delineation of Beaver, Hog, and Sycamore Sloughs**. The final delineation report was submitted to the Corps for review. The Corps formally verified and approved the delineation for a period of 5 years. The data is now part of the INDP GIS data base. (Contact: Jim Martin, 3-9715, Ray McDowell, 3-9499)

DREDGED MATERIALS ENVIRONMENTAL STUDY

Background

Staff has coordinated with the Corps, Regional Water Quality Control Board, Department of Health Services, and Fish and Game staffs to address potential concerns regarding toxic contaminants in channel sediments which might be mobilized during and after channel dredging operations. All activities under this subject category have been completed with the close cooperation and support of DLA staff.

Limited sampling was conducted in late 1989 to provide information for the draft EIR/EIS.

In response to comments received on the draft EIR/EIS, a workplan for a tiered approach to conduct more extensive dredge material testing was developed by the North Delta staff. The **North Delta Program and South Delta Water Management Program Work Plan, Environmental Study of Dredged Material, November 1991** was submitted for review to the Corps, DFG and the Central Valley Regional Water Quality Control Board. It was approved by the Board on December 5, 1991. Contracts for sampling and analysis were prepared with assistance of DLA staff. Taber Consultants and Pace Laboratories were awarded the work.

In FY 92-93, two contracts were awarded and administered by the North Delta staff to collect dredge material in both the north Delta and south Delta study areas. Soil and sediment samples were obtained from channel

sediments, levee slopes, and along the proposed alignment of setback levees. In addition, water quality samples were collected.

In FY 93-94 staff focused on completing the analysis of the samples collected for the Interim South Delta Program. This work was documented in a report, **Environmental Study for the Interim South Delta Program, Water, Sediment, and Soil Quality, May 1994.** The report was distributed for RWQCB staff review and approval on June 17, 1994. Other involved agencies, including the Corps, Department of Health Services, and DFG also received review copies.

Parallel to the implementation of the RWQCB approved workplan, North Delta staff has been involved in cooperative efforts with the managers of Staten Island to improve levees and construct waterside berms with dredged sediment along the South Fork Mokelumne to create shaded riverine aquatic habitat. The Staten Island activities provided us with an opportunity to collect homogenized sediment samples without incurring the expense of mobilizing a contractor to extract drill cores, to evaluate water quality impacts of typical Delta dredging operations, and to extend the areal coverage of our existing sampling network. At the same time, we provided the monitoring data and technical expertise to meet Regional Board monitoring requirements.

Department staff collected and analyzed sediment samples in 1991 when Staten Island raised levee crowns along the South Mokelumne River. Homogenized samples were collected at six sites.

In 1992 about 1500 feet of waterside berms were constructed just upstream of Beaver Slough along the South Mokelumne River. Nine water samples and four sediment samples were collected and analyzed.

In 1993 about 1400 feet of waterside berms were constructed along the South Mokelumne River. Four water samples and three sediment samples, and three levee soil samples were collected and analyzed.

FY 94-95 Activities

In 1994 the managers of Staten Island used dredged sediment, construction fabric, and rip-rap to augment and protect about 1.5 miles of shoreline along channel islands in the South Mokelumne River. We worked closely with the Regional Board, USFWS, Corps, and DFG staffs to develop a reasonable sampling program, including sampling prior to, during, and after construction. The sampling program was documented in **Environmental Study for the Staten Island SRAH Test Project Phase II, August 1994**. Again, we sampled water, sediment, and soils. Quarterly post-project monitoring has continued throughout FY 94-95 and will continue into FY 95-96. The monitoring program follows the guidelines established by the RWQCB in its Phase II Staten Island Monitoring and Reporting Program.

The various dredging projects involving the Division of Planning were documented in **Compilation of Division of Planning Dredging Projects in the Delta (1990-1994), April 1995**.

Staff completed the **Environmental Study for the Interim North Delta Program, Water, Sediment, and Soil Quality, May 1995**. The report has been submitted to the Corps, DFG, and the Regional Board for comment.

In general, the weight of evidence compiled to date indicates that the sediment in both the north Delta and south Delta areas is not hazardous to the ecosystem and will not create impacts when properly placed, vegetated, and protected from wave wash. (Contact: Marco Bell, 3-9981, Priyanka Arora, 3-6039)

CULTURAL RESOURCES INVESTIGATION

Background

In consultation with Corps Regulatory staff, we contracted with the USBR to conduct a Class II archaeological study of the north Delta study area in 1991. The survey included a records search, a literature search, reference to standard historic resource publications, and a field examination of a large portion of the project area. The results were reported in **Class II Archeological Survey, North Delta Program, Sacramento-San Joaquin**

Delta, California, March 1991. After completion of the report, Corps Regulatory staff indicated that the entire 100-year flood plain potentially affected by the INDP would need to be considered, due to the potential exposure of new areas to development. To satisfy this request, we requested that Department of Parks and Recreation archaeologists conduct the required study of the floodplain under an amendment to an existing contract managed by the Surface Water and Development Section.

In close collaboration with Corps Regulatory staff and our staff, Parks and Recreation archeologists conducted an intensive investigation throughout the FY of cultural and archeological records for the enlarged study area. They completed a preliminary draft report, **Class I Archeological Survey, North Delta Program, Sacramento and San Joaquin Counties, California, May 31, 1994.**

FY 94-95 Activities

During this FY the Corps Regulatory staff approved the completed archaeological study. This task is complete. (Contact: Jim Martin, 3-9715)

RECREATION STUDIES

Background

A draft recreation study was completed by USBR as part of its collaboration on the 1990 Draft EIR/EIS. With the enlargement of the north Delta study area requested by Corps Regulatory staff, proposed establishment of the USFWS Stone Lakes Wildlife Refuge and other developments, it became necessary to expand and update the recreation study. Central District staff was asked to perform the study and developed a workplan for the completion of the recreation studies for the Final EIR/EIS. Two 3-month field survey periods were scheduled. The first one was scheduled for April through June 1993 and was completed.

The second field survey was conducted in the period July through September 1993. The surveys included an assessment of recreational use intensity, as well as direct user input. Sacramento and San Joaquin counties, State Parks and Recreation, the Nature Conservancy, North Delta Conservancy, USFWS,

DFG, and Delta landowners were also contacted for input. A draft report, **Interim North Delta Program, Final Draft, Recreation Enhancement Potential, Reconnaissance Report, May 1994**, is currently being reviewed.

FY 94-95 Activities

Central District staff continued to work on the final report throughout this FY. It was not completed. The final report is scheduled for completion in early FY 95-96. (Contact: Marco Bell, 3-9981, Michelle Wong, 3-6059)

STUDY AREA MAPPING

Background

Mapping provides an invaluable tool for displaying alternatives and resource distributions, as well as conducting analyses. Given rapidly changing technology and a wide range of mapping needs within the Section, several mapping initiatives were initiated. These included developing simple graphic displays, one-foot contour maps of the channels and levees likely to be affected by the various project alternatives, and a Geographic Information System to display and evaluate the various resources being mapped for alternative analyses.

The graphic display of the INDP study area was developed to provide a versatile tool for displaying the various geographic, project, and resource characteristics in the study area for several purposes, including project management, interagency coordination, public meetings, and preparation of figures for the final EIR/EIS. The mapping system was implemented on the Reports Administration and Drafting Section Intergraph system, beginning with the base map, derived from 7.5' USGS quadrangle maps of the study area.

During FY 93-94, many layers were added to the map system, including project alternative features, seepage monitoring well locations, locations of sediment and soil sampling sites, jurisdictional wetlands, recreation facilities, flood inundation boundaries, and others. Additional layers will be input as the various INDP resource studies are completed.

Detailed contour mapping was initiated in FY 91-92 in response to comments received during review of the 1990 NDP DEIR/EIS, indicating that the project description was inadequate due to lack of detailed information about proposed levee and channel work. The contour mapping of all north Delta channels and adjacent areas potentially affected by the INDP was planned in phases, such that the highest priority segments would be completed first, beginning at the downstream end of the project area. The first phase of the project was completed in July 1993, including the North Fork Mokelumne River from New Hope Landing to the San Joaquin River. Most of the remaining mapping was completed during FY 93-94.

A Geographic Information System was initiated in FY 92-93 in cooperation with BDOC staff, to meet the joint goals of providing a short-term analytical tool for the INDP and to provide data and a test run of a system that could be expanded to meet the needs of the long-term Bay-Delta solution-finding process. A contract with U.C. Berkeley was initiated to provide technical assistance with developing a GRASS-based GIS system for the INDP. Efforts to purchase the necessary hardware were initiated.

During FY 93-94 the hardware was procured, and the joint DWR-BDOC contract with UC Berkeley was consummated. Staff was trained and the electronic link with UC Berkeley was established. Data entry was initiated, building on an enormous existing regional data base, including DWR's Delta land use mapping.

FY 94-95 Activities

The graphic display of the INDP study area was completed. (Contact: Sina Darabzand, 3-9648)

The one-foot contour mapping for the channels and adjacent areas was completed. Existing bathymetric data were combined with terrestrial aerial photography and ground surveys to generate the maps, which now reside on the Department's Intergraph system. Jurisdictional wetlands mapping data was imported and incorporated into the files. The system has been used to develop alternative cross-sections and to compute earthwork quantities. (Contact: Marco Bell, 3-9981)

Three data layers were imported to the GRASS based GIS system, including HEP cover mapping prepared by USFWS staff (see Wildlife Habitat Evaluation Studies section), archaeological data (see Cultural Resources Investigation), and jurisdictional wetlands delineation prepared jointly by Jones and Stokes associates and DWR staff (see Jurisdictional Wetlands Delineation). The contract with UC Berkeley continues, but CALFED staff has indicated that it no longer wishes to participate until its mapping needs are better defined. (Contact: Ray McDowell, 3-9499)

DESIGN STUDIES

Background

Preliminary design and cost estimate data has been developed for the Draft EIR/EIS. As originally conceived, the first phase of the INDP would focus on channel improvements in the Mokelumne River system. However, DWRDSM modeling showed that concurrent enlargement of the Delta Cross Channel gate structure would be cost effective and would enhance the benefits of Mokelumne River channel improvements. Thus the alternatives in the 1990 DEIR/EIS included Delta Cross Channel Gate enlargement, channel dredging, and levee setbacks.

In FY 93-94 a detailed project description was completed, patterned after the ISDP. Advance design of levee and channel improvements along the North Fork Mokelumne also moved forward, taking advantage of one-foot-interval contour mapping completed in the fiscal year. In accordance with written guidance provided by Corps Regulatory staff, detailed, reach-by-reach estimates of proposed cut, fill, and dredging, were advanced.

FY 94-95 Activities

In response to growing concerns about protecting Sacramento River Fisheries, comments on the DEIR/EIS, and anticipated needs of the long-term Bay-Delta solution-finding process, the range of alternatives was expanded to include a 2000 cfs diversion at Hood. Conceptual studies were initiated to evaluate potential diversion intake configurations, hydrodynamic impacts, fish impacts, water quality and water supply impacts, and other aspects of the alternative evaluation. These studies involved the participation of ESO,

Design, and Planning staffs. Two-dimensional hydrodynamic modeling was initiated to evaluate velocity distributions in the river, intake channel, and the vicinity of the screens. A contract with UC Davis was approved during this FY to allow UC Davis to provide technical support and to conduct physical modeling of the proposed diversion structure to further evaluate this critical area of inquiry. The actual modeling work was not initiated; however restoration of the U.C. Davis Hydraulics Laboratory was begun in order to support this and other laboratory studies. (Contact: Marco Bell, 3-9981, Michelle Wong, 3-6059)

More detailed evaluation was also undertaken for channel dredging and Delta Cross Channel Gate Structure enlargement. (Contact: Marco Bell, 3-9981)

SEEPAGE MONITORING

Background

During the DEIR/EIS comment period, Delta landowners and reclamation districts expressed strong concerns about the potential for increased seepage as a result of proposed levee and channel modifications. These concerns established the need for baseline data on groundwater levels along the channels affected by the proposed work. Accurately quantifying seepage in the study area is very difficult due to seasonal changes in irrigation water application, precipitation, and evapotranspiration. However, seepage monitoring data, combined with drainage pumping and precipitation data, can help quantify potential project-induced changes.

Accordingly, a network of 71 monitoring wells was drilled and developed along the North Fork, South Fork, and main stem of the Mokelumne River, Potato and Snodgrass Sloughs to establish baseline seepage conditions for the NDP project area.

During FY 93-94 the Division of Land and Right of Way paid the property owners \$900 per well for the use of their land and for the entry permits that they have given DWR to monitor the wells for the next 10 years. Central District staff completed a report, **Interim North Delta Program, Seepage Monitoring Network, April 1994**, which was distributed to all affected

landowners and interested parties. The report documents the well logs and locations of all wells. Regular monitoring and well maintenance were also established during the fiscal year. Two automatic recorders were purchased to monitor deep wells on a rotating basis.

FY 94-95 Activities

During this FY the seepage monitoring wells have been routinely monitored. A few problem wells have been identified. These have been targeted for rehabilitation or repair, which is anticipated to occur in FY 95-96. (Contact: Sina Darabzand, 3-9648, Jake Compton, 3-8637)

SEDIMENTATION AND SCOUR MONITORING

Background

During the DEIR/EIS comment period, Delta landowners and reclamation districts expressed strong concerns about the impact of existing and potential SWP- and CVP-induced flow increases through north Delta channels and their impacts upon channels and levees maintained by local forces. These concerns and the need for basic descriptive data for the hydrodynamic evaluation in the EIR/EIS established the need for monitoring seepage and scour. Accordingly, a network of 38 stations has been designed to monitor and establish baseline conditions for the cross sections and scour-sedimentation characteristics in the North Fork, South Fork, and the main stem of the Mokelumne River, Delta Cross Channel, Deadhorse Cut, Snodgrass, Beaver, Hog, and Sycamore Sloughs.

During FY 93-94 entry permits were obtained by Division of Land and Right of Way staff and the 38 stations were installed by Central District staff, each station consisting of cable anchors, a staff gage, and bench mark. Regular monitoring was also initiated.

In addition, there was a need to compile data on historic sediment movement through the Delta, to provide a framework for defining long-term impacts of channel dredging and future maintenance activities. UC Davis staff was asked to investigate and report on this component.

FY 94-95 Activities

Two scour monitoring surveys were completed during FY 94-95. Central District staff released the memorandum report, **Interim North Delta Scour Monitoring 1994, June 1995**. (Contact: Sina Darabzand, 3-9648, Jake Compton, 3-8637)

UC Davis completed its report, **Historic Sediment Loads in the Sacramento-San Joaquin Delta, October 1994**.

AERIAL PHOTOGRAPHY

Background

Aerial photography provides vital information for a range of resource evaluations, including wildlife habitat, wetlands, flood hydrology, land use, utilities, transportation, and aesthetics. Three sets of aerial photographs of the north Delta area have been taken and developed. The first set was taken on February 14, 1993, covering an area from the Highway 12 bridge over the Mokelumne River to south of Sacramento (Pocket Road), and from the City of Galt to McConnell Station, the Southern Pacific Railroad bridge over the Cosumnes River. This set is in natural color, at a scale of 1:24,000.

The second set was taken on March 22, 1993, covering an area from Antioch to south Sacramento, and West Manteca to north of Stockton. This set is in infrared, also at a scale of 1:24,000.

The third set covers the whole statutory Delta in infrared, at a scale of 1:24,000. This set was taken in June 1993 to provide a current resource for the State-Federal long-term Bay-Delta solution finding process.

FY 94-95 Activities

The north Delta area was photographed on March 15, 1995 in normal color to identify areas of inundation, to provide additional verification data for the flood modeling effort and to assist in mitigation planning for the Grizzly Slough Site. (Contact: Sina Darabzand, 3-9648)

INTERAGENCY COORDINATION MEETINGS AND PUBLIC REVIEW

Background

Throughout the planning process Department Staff has worked closely with the various regulatory and cooperating agencies, including the Corps, USBR, USFWS, NMFS, EPA, DFG, SWRCB, RWQCB, State Lands Commission, and others. Formal interagency coordination meetings were not held for several years, to assure that these agencies could focus on the ISDP.

FY 94-95 Activities

Beginning in March 1995 monthly interagency coordination meetings were held. The meetings have focused on providing technical information about the scope, methods, and results of the various studies underway and on soliciting agency input. (Contact: Jim Martin, 3-9715, Ray McDowell, 3-9499).

INDP staff also began work on an Internet home page to provide ready access to reports, maps, and data relating to the environmental documentation process. When operational, this home page will facilitate communication with regulatory and cooperating agencies, stakeholders, and consultants.

REPORT PREPARATION AND RESPONSES TO COMMENTS

Background

Four reports are required to comply with the various legal and technical requirements of the INDP environmental documentation process. These include the EIR/EIS, the 404(b)(1) Alternatives Analysis Report, the Feasibility Report, and the Mitigation Plan Report. The Section goal is to complete these draft documents for agency and public review in accordance with the Department's planning schedule.

Numerous comments were received after release of the DEIR/EIS in November 1990. In order to facilitate an efficient response to these comments, a cross index was created in FY 1992-93. The comments have been compiled in report format for use by staff and other interested parties.

In response to Corps Regulatory comments that the 1990 report was poorly organized, a new outline was developed, patterned after recently released documents for Los Vaqueros Reservoir, Delta Wetlands, and the Stone Lakes Wildlife Refuge. The outline was submitted for review and approval to Corps Regulatory staff in a meeting on June 15, 1992.

The draft EIR/EIS text was reorganized in accordance with the revised outline. On March 1, 1994 the EIR/EIS outline was again provided to the Corps and to Entrix for review and comment. On May 10, 1994 the Corps suggested that the ISDP outline be followed instead. The text will be revised accordingly as it is prepared for publication. The comment cross index has been completed.

FY 94-95 Activities

During this FY about 40 percent of the text for the revised draft EIR/EIS has been drafted, following the pattern set by the ISDP draft EIR/EIS prepared with assistance from Entrix. (Contact Jim Martin, 3-9715)

A draft 404(b)(1) Alternatives Analysis Report was completed and made available to the Corps and EPA for staff level review and comment. The report was reviewed by Entrix, under contract with the Corps and funded by DWR. Staff has incorporated Entrix comments. EPA staff has not provided comments to date. (Contact: Sina Darabzand, 3-9648, Jake Compton, 3-8637)

A Feasibility Study Report was initiated during the FY. It will describe the alternatives in detail, including conceptual drawings, construction methods, quantities, and costs. Text preparation is about 20% complete. (Contact, Marco Bell, 3-9981, Michelle Wong, 3-6059)

A Mitigation Plan Report was initiated during the FY, patterned after the Coastal Aqueduct Project. Work was taken as far as possible and text preparation is about 50% complete. Completion of the draft must await quantification of impacts and the determination of mitigation measures. (Contact: Marco Bell, 3-9981, Priyanka Arora, 3-6039)

LONG-TERM PLANNING SUPPORT ACTIVITIES

BORROW MATERIALS, MITIGATION, AND ENHANCEMENT PLANNING

Background

Identification of a secure source of borrow materials for levee improvements has been a significant program concern. For proposed levee improvements the Department would need a source of good quality material close to the project construction zone. The environmental impacts of borrow operations must be identified and mitigated. Since there are no commercial sources of large quantities of soil located close to the project area, it was determined that a borrow site would need to be identified and acquired by negotiated sale or condemnation. Potential borrow sites were investigated and documented in a memorandum report, **North Delta Borrow Investigation, May 1990**.

The impacts and mitigation associated with the borrow operations need to be specifically defined in the EIR/EIS, prior to project implementation.

We therefore decided that it would be in the Department's best long-term interest to search for an appropriate land parcel, which could be acquired from a willing seller to provide a secure borrow site, for which borrow operations could be carefully planned to maximize benefits.

Such a parcel, if appropriately contoured and managed, could provide mitigation for potential project impacts, as well as a venue for environmental enhancement, public education, and recreation. A related acquisition goal was to promote cooperation, enhance the Department's image, and promote cooperation with resource agencies, regulatory agencies, environmental groups, and the public.

Accordingly, we began the search for suitable parcels in the north Delta area in 1991. Concurrently, we met with DFG staff to enlist their assistance in conceptual planning for the borrow operations, such that wildlife habitat value would be maximized. During the search we coordinated with DFG, The

Nature Conservancy, Ducks Unlimited, the USFWS and other interested parties.

The Nature Conservancy recommended that we evaluate a parcel on the southern boundary of the Cosumnes River Preserve. The owner was willing to sell, so the Department conducted an appraisal, conducted geologic exploration, and performed other evaluations. In October 1992 the Department acquired the 482-acre parcel adjacent to the Nature Conservancy's Cosumnes River Preserve, about one mile northeast of Thornton, for mitigation, restoration, and borrow activities.

During FY 93-94 DFG began more detailed work on a conceptual habitat plan for the property. At the same time, we decided to use a portion of the property to provide borrow materials and a mitigation site for the Thornton Levees Project. In addition to meeting the Thornton Levees Project needs, this would provide an excellent demonstration project for implementation of future projects. Agreements between DWR, Reclamation District 348, and DFG were developed which defined boundaries, easements, maintenance practices, and funding. Since the property was purchased with project funds it was agreed that SB 34 funds would be used to reimburse these funds in proportion to the land area required.

During the winter of 1994 a portion of the property was flooded to evaluate the potential for improving wintering waterfowl habitat. The project was remarkably successful, yielding very high occupancy and habitat value for tundra swans, sandhill cranes, and various other ducks, geese, and shorebirds.

FY 94-95 Activities

During this FY borrow materials were removed from the 34-acre parcel and used for the Thornton levee improvements.

The SWP fund was fully reimbursed for the loss of this parcel.

Staff met with the Cosumnes River Preserve cooperators to begin discussing potential DWR participation as a cooperator in the Preserve. Tentative, staff level agreement was reached on a conceptual approach, in which DWR's financial support, and Preserve boundaries, would grow incrementally, as

each mitigation or enhancement parcel is developed. Ultimately, the entire parcel could be managed as an integral component of the Preserve. The levee protecting the property from the Cosumnes River were overtopped, resulting in some levee damage.

DFG staff completed its report, **Conceptual Habitat Plan for the Grizzly Slough Project Area, April 1995.** (Contact: Jim Martin, 3-9715, Ray McDowell, 3-9499)

LAND ACQUISITION TO PROTECT FUTURE PLANNING FLEXIBILITY

Background

The Hood area may prove to be strategic for future water resources development because it is a likely location for a screened diversions from the Sacramento River. Such diversions include a wide range of options, such as through-Delta systems, isolated conveyance facilities, or a combination of isolated and through-Delta transfer systems. There is also a potential for construction of smaller scale diversion facilities to provide practical information to guide the Delta solution-finding process.

Efforts to acquire such property began in 1992. A 200-acre parcel just north of Hood was available for sale. An appraisal was completed. The County of Sacramento was also interested in this parcel for possible use as a regional park. Section staff, Legal, and DLROW staff worked with Sacramento County to draft an MOU for cooperative use of the property; however, the landowner chose to terminate the acquisition negotiations.

Two additional parcels were then identified for potential acquisition and appraisals were initiated in 1993. An appraisal of the Stillwater Orchards Cold Storage Plant was completed on June 1, 1994.

FY 94-95 Activities

The appraisal for the 122-acre River Valley Vineyards was completed in October 1994. Staff requested permission to acquire the property, and involved the SWC in the acquisition evaluation. Permission to acquire was

granted on January 26, 1995. Staff prepared an **Initial Study and Negative Declaration for Proposed Interim North Delta Program Land Purchase, March 1995**. The proposed purchase was discussed with DFG and Parks and Recreation staffs, public notices were filed, and after the appropriate comment period, a Notice of Determination was filed. No adverse comments were received. Negotiations with the landowner were conducted concurrently and the acquisition completed in June, 1995. A detailed environmental site assessment was completed by BSK and Associates under the direction of DLA. An underground tank was removed, and various locations on the property were tested. No significant toxic hazards were identified.

Staff also requested permission to acquire the Stillwater Orchards Cold Storage Plant. Again, the SWC was involved in the facility evaluation. Staff met with SWC staff, planning committee members and the Board of Directors during the fall and winter. The Board of Directors expressed concerns about the potential cost and liabilities of the property, as well as its incremental value, assuming the River Valley Vineyards property were acquired. Staff prepared a detailed response to the questions raised by the Board, documented in a memorandum report, **Evaluation of Stillwater Orchards Property, June 1995**. Based upon the evaluation, permission was again requested to move forward with acquisition. (Contact: Jim Martin 3-9715, Stein Buer, 3-6628)

LAND MANAGEMENT AND INTERAGENCY COORDINATION ACTIVITIES

East Delta Land Management Committee Background

The East Delta Land Management Committee was created on July 22, 1993 to assure that current and proposed management of DWR lands in the east Delta are consistent with the DWR's long-term water resources planning needs. The committee includes DLROW, Planning, Legal, and ESO staff. The committee initiated action on several fronts, including an evaluation of biological resources currently existing on DWR's east Delta properties, renewal of the lease agreement with DFG, which expired several years ago,

and addressing the hundreds of seepage monitoring wells left in place after the original planning effort for the proposed Peripheral Canal.

FY 94-95 Activities

With input from the committee, ESO staff completed the **1994 Biological Characterization of the East Delta Properties, January 1995**. With input from the committee and Central District staff, Project Geology staff prepared an assessment of costs associated with identifying and removing the existing seepage monitoring wells. The committee recommended that a systematic effort to identify and destroy the wells be initiated. The request is currently being reviewed. The committee is currently developing proposed objectives and management options for the east Delta properties, to provide a framework for negotiating a new agreement with DFG. (Contact: Jim Martin, 3-9715, Ray McDowell, 3-9499)

USFWS Refuge Coordination

Background

Our staff worked closely with the USFWS during the environmental documentation process for the Stone Lakes National Wildlife Refuge to assure that the refuge would not place undue burdens on potential future State water resources development. As a result, the 1992 Record of Decision for the EIS committed the USFWS to working cooperatively with DWR to develop an MOU which would address appropriate elements of Governor Wilson's Comprehensive Water Plan.

The MOU between the USFWS and DWR was signed in July 1993. Since then, we have continued to coordinate with USFWS staff, particularly with respect to potential acquisition of land parcels located between Lambert Road and Lost Slough. We requested appraisals of key properties in this area. The appraisals were not completed because the landowner denied permission for field verification of the appraisals, signalling a loss of interest in selling the properties.

FY 94-95 Activities

This FY activities have been limited to periodic meetings with USFWS Refuges staff to maintain good cooperation and communication. (Contact: Jim Martin, 3-9715, Ray McDowell, 3-9499)

FISHERIES MITIGATION AND ENHANCEMENT ACTIVITIES

Background

Concerns about the decline of key resident and anadromous fish species dominate the Delta water resources planning process and were frequently cited in comments received on the North Delta Program Draft EIR/EIS. Since release of the DEIR/EIS our staff has devoted substantial effort to potential measures which could help mitigate for project impacts in the Delta and which could help restore key fish populations.

Our staff prepared the **Draft Workplan: Proposed Demonstration Fish Protective Facilities, October, 1991**, released under the auspices of the Fish Facilities Technical Committee. The workplan suggested a three-phase program to advance studies required to develop a screened intake design for the Hood area. The first phase would involve acquisition of land in the vicinity of Hood and conducting evaluations of various screening components. The second phase would involve constructing a larger scale screened diversion, but would return the flow to the Sacramento River, to allow the technology to advance without confronting the thorny issues of Delta flow re-distribution. In the third phase, when the screening issues would be resolved, the diversion of the screened flow into the central Delta would begin. In cooperation with ESO staff, we initiated several actions to advance the workplan:

- We contracted with U.C. Davis to conduct a study of potential fish screening through sand bed or construction fabric filters, summarized in **Sand Bed Filters for Screening Fish at Diversions from Rivers-- A Feasibility Study, September 1993**.
- We developed conceptual plans for a demonstration facility, with conventional screens to allow for diverting water from the Sacramento River, test flumes, and other elements.
- We initiated efforts to acquire land in the vicinity of Hood as is described in more detail elsewhere in this report.

In FY 92-93 the Section directed the Georgiana Slough Test Barrier Project, to design and evaluate the potential benefits of blocking Georgiana Slough at its junction with the Sacramento River. Also discussed were options such as testing acoustic barriers, barging of hatchery reared smolts, diverters, diversion of smolts into the Sacramento River Deep Water Ship Channel, reducing fish entrainment at Twitchell Island, and reducing predation in Clifton Court Forebay. Over a period of six months staff prepared the required environmental and technical documentation and conducted public involvement, interagency coordination, and permit processing. Documents included the **Initial Study and Mitigated Negative Declaration, Georgiana Slough Test Barrier Project to Protect Winter Run Salmon, August 1992**, with three technical appendices, plans, and specifications.

The Department chose to halt the project in December 1992, primarily because DFG set very stringent flow requirements to limit longfin smelt impacts, resulting in a high water cost associated with barrier installation.

In the spring of 1994 the Delta Mendota and San Luis Water Authority spearheaded an effort, with DWR and USBR support, to test an acoustic barrier at the mouth of Georgiana Slough. The Authority was able to use much of the environmental documentation prepared by the Department and to capitalize on the attention focused on Georgiana Slough. Interest groups which had strongly opposed a physical barrier generally perceived the acoustic barrier concept as a very desirable alternative.

Our unit assisted the effort to advance acoustic barrier testing by compiling site assessment data for approximately 13 other sites in the Delta which might be appropriate for other acoustic installations.

In FY 93-94 we recommended to the Corps that it conduct a reconnaissance-level investigation of the Sacramento Deep Water Ship Channel as a supplementary migration route for salmon. The Corps initiated such an investigation in January 1994. Section staff worked closely with the Corps to provide information and input, to coordinate modeling support, and to assist in study design.

Section staff completed an environmental assessment of several potential sites for testing of acoustic barriers and provided this information to the San Luis-Delta Mendota Water Authority, which has taken the lead on the Georgiana Slough acoustic barrier tests.

Section staff initiated a preliminary investigation of barging as a potential tool for enhancing survival of hatchery raised salmon stock.

A short study, including limited field sampling, was also conducted to evaluate near-shore turbidity induced by boat wakes in the Delta. This study, conducted by DLA staff, was summarized in a memorandum report, **Presentation of Results from the Investigation on the Effects of Motorized Boating Activities on Delta Water Quality, December 13, 1993**. Although this pilot study was very limited in scope, it suggested that boating traffic and associated recreational use should be investigated more intensively as a factor in the decline of the Delta's ecological health. A limited follow-up study was initiated under contract with UC Davis.

FY 94-95 Activities

The study of salmon smolt barging was completed. It concluded that such barging would be technically difficult and of limited merit, given the characteristics of the Sacramento River basin and the salmon population distribution. (Contact: Marco Bell, 3-9981, Michelle Wong, 3-6059)

The Corps completed the reconnaissance report, **Lower Sacramento River Fish Migration, California, April 1995**, with Department staff participating in formulation, text review, and Corps review meetings. Federal interest in fish migration restoration was established, laying the groundwork for a feasibility study and/or 1135 enhancement projects. The Corps has focused on four potential actions, including facilities to allow upstream migrating salmon adults to pass through the William B. Stone Lock structure, enhancement of riparian vegetation along the lower Sacramento River, acoustic barriers to preferentially guide smolts into Sutter and Steamboat Slough, and facilitating smolt passage through the Yolo Bypass. Department staff drafted a Letter of Intent to participate in a feasibility study, which was approved by the Director and sent to the Corps. Design of the feasibility study was initiated. (Contact: Sina Darabzand, 3-9648, Shahram Ahi, 3-7195)

UC Davis completed its review of the effects of boating and turbidity on the near-shore environment. The results were reported in **Turbidity Study (A Literature Review)**, May 1995. (Contact: Marco Bell, 3-9981)

A preliminary evaluation of the large-scale use of cylindrical instream screened intakes was completed, which suggested that such intakes may offer substantial advantages over conventional folded-V screened intakes. Evaluation of this concept is continuing. (Contact: Stein Buer, 3-6628)

Efforts to advance a fish screen demonstration facility in the vicinity of Hood continued in the FY. These efforts overlap with design and land acquisition activities, which are described elsewhere in this report. Discussions with key Delta fisheries experts have indicated that there is a need for a demonstration facility to advance the understanding and design technology for various fish protective components. A conceptual proposal was developed to purchase the Stillwater Orchards Cold Storage Facility in Hood to provide a venue for fishery impact reduction studies. (Contact: Stein Buer, 3-6628)

PERMITS PROCESS

Background

Department of the Army (404(b)(1) Permit Application: Application filed March 10, 1989

401 Certification Application: Application filed March 10, 1989.

USFWS/NMFS Sect. 7, Sect 10: Informal consultation initiated October 7, 1987.

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